A 20-Year-Old Patient with Idiopathic Non-Sustained Ventricular Tachycardia

Eurasian Clinical and Analytical Medicine Case Report

A Patient with Ventricular Tachycardia

Afsin Emre Kayipmaz[1], Orcun Ciftci[2], Cemil Kavalci[1], Betul Akbuga Ozel[1], Elif Celikel[1]
[1] Department of Emergency
[2] Department of Cardiology, Faculty of Medicine, Baskent University, Ankara, Turkey

Abstract
Ventricular tachycardia occurring in persons without apparent heart disease is called idiopathic ventricular tachycardia. In this paper we aimed to report a 20-year-old female subject without overt structural heart disease who presented with non-sustained ventricular tachycardia. She was admitted to our emergency department with back pain for 16 hours. She gave no history of smoking, alcohol intake, illicit drug use, heavy consumption of caffeinated beverages, or severe bodily exercise. An electrocardiogram taken in the emergency department showed short bursts of a broad QRS tachycardia with monomorphic, left bundle branch block morphology complexes and an inferior axis. The patient's tachycardia spontaneously terminated during emergency department stay. With the initial diagnosis of idiopathic ventricular tachycardia, discharged the patient on metoprolol 50 mg PO after observing that her vital signs were stable and cardiac enzymes negative. Idiopathic ventricular tachycardia should be considered in the differential diagnosis in cases presenting to emergency department with palpitations, dizziness, chest or back pain, and syncope.

Keywords
Arrhythmias; Cardiac; Idiopathic; Tachycardia; Ventricular; Young Age

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Corresponding Author: Afsin Emre Kayipmaz, Emergency Department, Baskent University Faculty of Medicine, Bahcelievler, Ankara, Turkey.
P.: +90 312 203 68 68 · **F.:** +90 312 223 64 39 · **E-Mail:** aekayipmaz@baskent.edu.tr

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Introduction

Ventricular tachycardia occurring in persons without apparent heart disease is called idiopathic ventricular tachycardia [1]. Eighty percent of idiopathic monomorphic ventricular tachycardias originating from outflow tracts originate from the right ventricle, and they are of benign character [2]. These arrhythmias are usually present electrocardiographically with broad, monomorphic QRS complexes; their mechanism of occurrence includes all types of arrhythmia mechanisms, namely reentry, increased automaticity, and triggered activity [3].

In this paper we aimed to report a 20-year-old female subject without overt structural heart disease who presented with non-sustained ventricular tachycardia.

Case Report

A 20-year-old woman was admitted to our emergency department with back pain for 16 hours. She had no chest pain or dyspnea. She stated that she had sometimes noticed that her pulse accelerated but that did not give her too much discomfort. Her past history was remarkable for panic disorder. However, she gave no history of smoking, alcohol intake, illicit drug use, heavy consumption of caffeinated beverages, or severe bodily exercise. She had normal weight and height. She told that she was under intense emotional stress because of her examination week. Her relatives brought previous electrocardiograms and echocardiogram performed by another cardiologist for the complaint of palpitations. The old electrocardiography showed normal sinus rhythm and the old echocardiography demonstrated floppy mitral valve.

Her vital signs included an arterial blood pressure of 142/97 mmHg, a body temperature of 36.8 degrees, a pulse rate of 126 beats per minute, a respiration rate of 20 breaths/minute, and a pulse oxygen saturation of 98%. In physical examination a rapid heartbeat was noticed. However, heart sounds were normal and no murmur was heard. An electrocardiogram taken in the emergency department showed short bursts of a broad QRS tachycardia with monomorphic, left bundle branch block morphology complexes and an inferior axis (Fig. 1). The focused heart ultrasonography (FOCUS) revealed mild mitral valve prolapse and first degree mitral regurgitation. The laboratory results were as follows: blood urea nitrogen 9 (6-19) mg/dL, creatinine 0.66 (0.5-1.2) mg/dL, sodium 135 (135-146) mmol/L, potassium 4 (3.5-5.2) mmol/L, CK-MB mass 0.6 (0-3.4) ng/mL, high sensitivity troponin I 0.001 (<0.016) ng/mL, hemoglobin 14 (12-16) g/dL, leukocyte count 7.29 (4.5-11) 1000/μL, thrombocyte count 326 (150-400) 10000/μL. In blood gas analysis pH was 7.43, blood glucose 95 mg/dL(70-110), carboxyhemoglobin %0.9 (0.0-2.5), lactate 1.2 mmol/L (0.5-1.6 mmol/L), ionized calcium 1.15 (1.12-1.30) mmol/L. The patient's tachycardia spontaneously terminated during emergency department stay. With the initial diagnosis of idiopathic ventricular tachycardia, discharged the patient on metoprolol 50 mg PO after observing that her vital signs were stable and cardiac enzymes negative. She was recommended to be seen in the cardiology clinic.

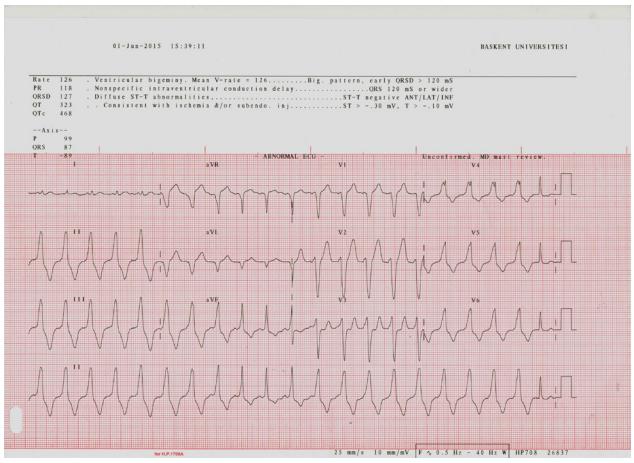

Figure 1. The admission ECG of the patient

Discussion

Herein, we report a 20-year-old patient presenting to our emergency department with non-sustained ventricular tachycardia. Her admission ECG showed a wide QRS tachycardia of left bundle branch block pattern that had a rate of 130 beats per minute, dominant R waves in the inferior leads, a QS pattern in V1 together with a transition zone at V4. No overt structural heart disease was detected in the initial tests. As is the case in our patient, individuals with idiopathic ventricular tachycardia of outflow origin are typically hemodynamically stable and usually present with symptoms of dizziness or palpitations. These tachycardias may either occur as repetitive monomorphic non-sustained ventricular tachycardia attacks, as in our patient, or sustained ventricular tachycardia episodes usually occurring during exercise or emotional stress. They are usually seen between the ages of 20 and 40, as our patient [4]. The pathophysiological mechanism underlying outflow tachycardias are thought to be triggered activity and they are also referred to as adenosine-sensitive ventricular tachycardias, although it responds to verapamil and beta blockers (most commonly propranolol, but also other beta blockers). Outflow tachycardias are either of right ventricular outflow tract or left ventricular outflow tract origin, the latter also confines areas around or within aortic cusps. These tachyarrhythmias are usually benign, with sudden death episodes having been extremely rarely reported. Thus, they are usually considered not to be aggressively treated, although life-limiting arrhythmias or syncopal spells should prompt therapy. In severely symptomatic cases calcium channel blockers (mainly verapamil), beta blockers (mainly propranolol), and other antiarrhythmics (e.g amiodarone, sotalol, propafenone etc.) can be used, although potentially hazardous antiarrhythmics are rarely needed [5]. In recent years, these arrhythmias have been increasingly treated to cure by radiofrequency catheter ablation. In the emergency department, physicians should first exclude ischemia, electrolyte, acid-base disorders or thyroid disease, followed by intoxication, particularly with tricyclic antidepressants, antiarrhythmics, digoxin, and some herbal products. Some patients with arrhythmogenic right ventricular dysplasia may present with outflow tachycardias mimicking the idiopathic variety, complicating the diagnosis.

We deemed our patient symptomatic due to emergency department admission, although her primary complaint at the time of admission was not palpitations. We begun metoprolol succinate given that her tachycardia was consistent with an outflow tachycardia and she had minimal mitral valve prolapse. We did not consider any necessity to urgently consult the patient with the cardiology department with the intention to perform an electrophysiology study; rather, we discharged the patient with the recommendation to see an electrophysiologist on an elective manner.

In conclusion, idiopathic ventricular tachycardia should be considered in the differential diagnosis in cases presenting to emergency department with palpitations, dizziness, chest or back pain, and syncope. Ischemia, electrolyte and acid-base disorders, thyroid disease, and intoxications should be ruled out in every case, and structural heart disease should be sought for. Asymptomatic cases can be followed without any specific therapy while symptomatic cases can be either treated with medical therapy or radiofrequency catheter ablation.

Scientific Responsibility Statement
The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement
All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest
None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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